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## A NEW INTERGENERIC NATURAL HYBRID INVOLVING ORYZOPSIS AND STIPA (GRAMINEAE)

WILLIAM A. WEBER<sup>1</sup>

NATURAL HYBRIDIZATION on the generic level, involving the widely-distributed *Oryzopsis hymenoides* (Roem. & Schult.) Ricker of western United States and various species of *Stipa* with which it comes into contact over its range, is an established fact although the phenomenon is evidently extremely rare. In only one instance has the hybrid been detected in nature and recognized as such; the analysis of Johnson and Rogler (1943) of a putative hybrid from the Badlands of North Dakota showed the plant to be a sterile 65-chromosome offspring of a cross between the 82-chromosome *Stipa viridula* and the 48-chromosome *Oryzopsis hymenoides*. These authors showed that *Oryzopsis caduca* Beal could be identified with the hybrids under analysis, and they proposed the name  $\times$  *Stiporyzopsis* for the hybrid combination *Stipa*  $\times$  *Oryzopsis*, giving the name  $\times$  *Stiporyzopsis caduca* (Beal) Johnson & Rogler to the combination *Stipa viridula*  $\times$  *Oryzopsis hymenoides*.

Later, Johnson (1945) followed this work with a survey of herbarium specimens in the major American collections and demonstrated that similar hybrids reposed therein under various names in *Stipa* and *Oryzopsis*. In each instance, the *Oryzopsis* parent was undoubtedly *O. hymenoides*; the *Stipa* parent was inferred by the geographic location of the hybrid and by extra-

<sup>1</sup> University of Colorado Museum, Boulder.

polation of the *Stipa*-like characteristics of the hybrid to the appropriate *Stipa* species. Hybrid combinations were shown to exist between *Oryzopsis hymenoides* and six species of *Stipa*. For the new hybrids Johnson abandoned the practice of describing them under  $\times$  *Stiporyzopsis* and indicated their hybrid status by connecting the two species names with an  $\times$ .

In June, 1957, the present writer discovered a single plant of a *Stipa-Oryzopsis* hybrid in nature on outcrops of the Pierre (Cretaceous) shales 6 miles north of Boulder, Colorado. This hybrid presents a combination of species not previously reported, and the fact that the hybrid nature of the plant was suspected at the time of discovery makes possible some observations of behavior which might otherwise have been overlooked.

The Pierre shales form a series of low hogbacks abutting against the first foothills of the Rocky Mountains north of Boulder; they are more arid than the surrounding mesas and plains and support good stands of *Oryzopsis hymenoides* and several species of *Stipa*, including *S. comata* Trin. & Rupr., *S. neomexicana* (Thurb.) Scribn., *S. robusta* Vasey & Scribn., *S. scribneri* Vasey (very rare), and *S. viridula* Trin. This list of *Stipa* species points up the importance of field recognition of the hybrids and accurate observation of the ecological situation *in situ*, especially since extrapolation of characters for determination of the *Stipa* parent would be quite difficult considering the large number of possibilities.

A single plant of the hybrid intermediate was detected in a large pure stand of *Stipa neomexicana* on the relatively gentle southeast-facing slope of a low hogback. The nearest specimens of any other species were more than 100 feet away; *S. comata* became common and intermingled with *S. neomexicana* several hundred feet to the north on more disturbed sites; *S. robusta* and *S. viridula* were roadside plants a greater distance away. A few clumps of *Oryzopsis hymenoides* were scattered through the *S. neomexicana* stand, but these did not form a pure stand until the slope became west-facing on the steeper side of the hogback some five or ten feet upslope. On the west face of the hogback the *Stipa* largely disappeared and was replaced by a good stand of *Oryzopsis*. The hybrid individual is well-established, forming a clump at least eight inches in diameter, and exceeds in height (the





PLATE 1230. *Oryzopsis*  $\times$  *Stipa* hybrid. Left to right, *Oryzopsis* *hymenoides*, *Oryzopsis* *hymenoides*  $\times$  *Stipa* *neomexicana*, *Stipa* *neomexicana* (scale shows 10 cm.).

tallest culm, not yet in anthesis, is 0.9 meters) the *Stipa neomexicana* plants growing nearby.

In general aspect (Plate 1230) the plant resembles the *Stipa* parent, being tall and erect, with the panicle branches slightly more spreading than strict but certainly not divaricate as in *O. hymenoides*. However, in most technical characters the dominance of the *Oryzopsis* genotype is pronounced. The pedicels are just flexuous enough to suggest the condition in *Oryzopsis*; the awn, although geniculate as in *Stipa*, is deciduous and very short compared to the extremely elongate awn of *neomexicana*; and the plumose indument of the awn, diagnostic for *neomexicana*, is completely suppressed in the hybrid. In short, the hybrid combines the growth form of the *Stipa* parent with most of the technical characters of the *Oryzopsis* parent. By inference, the hybrid probably embodies the physiological characters of the *Stipa* parent in whose habitat it grows. In anthesis it appears to be later than either parent.

The circumstantial evidence is strong for *Stipa neomexicana* to be the seed parent of the hybrid, even though other species of *Stipa* occur in the vicinity. The intermediate is 'insulated' by a large pure colony of *neomexicana*, resembles it in habit, and appears to be of an age with the surrounding plants. Unfortunately, the hybrid does not appear to carry any trait which would be absolutely diagnostic of a specific *Stipa* species. In fact, if one reviews the case histories of the various hybrids known, it is strikingly evident that the hybrid individuals are exceedingly similar regardless of the *Stipa* parentage. It is as if the *Oryzopsis* genotype quite uniformly suppressed whatever diversity of awn length, glume length, etc., would be expected to modify the various  $F_1$  phenotypes in the direction of the *Stipa* parent.

The characteristics of the parental species and of the hybrid are outlined below. Because the *Stipa* and *Oryzopsis* plants were in the 'soft dough', and 'milk' stage, respectively, observations on their anthers and pollen were not possible. The inflorescences of the intermediate had not yet opened to discharge pollen, and the pollen was tested with iodine and examined microscopically; nothing but empty pollen with negative starch-reaction was found.



TABLE I. Morphological characters of parental species and hybrid

Character	<i>Oryzopsis hymenoides</i>	<i>Stipa neomexicana</i>	hybrid
Panicle	divaricate	strict	narrow, slightly spreading
Pedicels	flexuous	straight	slightly flexuous
Branchlets	10-16 spikelets	1-4 spikelets	10-16 spikelets
Glumes	ovate 8 x 2.5 mm. 3 prominent nerves	lanceolate 43 x 3.0 mm. 3 prominent and 2 short, faint nerves	lance-ovate 9 x 2.5 mm. 3 prominent nerves
Lemma	broad-fusiform	linear-fusiform	intermediate, nearer broad-fusiform
	4 x 1.5 mm. black	16 x 1.5 mm. pale brown	5.8 x 1.5 mm. pale brown
(awn)	6 mm., barbellate	180 mm., plumose	16-17 mm., barbellate
	straight, deciduous	geniculate, persistent	geniculate, deciduous
(trichomes)	3 mm. long, spreading, white, dense	0.3 mm. long, appressed, white, and tawny, sparse	1.0 mm. long, appressed, white, sparse
Ligule	lanceolate 7 mm. long hyaline	truncate, ciliate 0.3 mm. long thick	lanceolate 3 mm. long hyaline
Pollen			empty, shriveled IKI negative
Anthers			red, 5.5 x 1.5 mm. sacs equal, bearded

For taxonomic purposes the new hybrid is described as follows:

*Oryzopsis hymenoides* (Roem. & Schult.) Ricker × *Stipa neomexicana* (Thurb.) Scribn., hybr. nov.

Planta perennis usque ad 1 m. alta. Paniculae angustae rami plus minusve flexuosi 10-16-spiculas ferentes. Glumae ut in specie *Oryzopsis hymenoides* sed paulo elongatiores. Lemmata lato-fusiformia 5.8 × 1.5 mm. brunnescentia arista barbellata decidua geniculata 16-17 mm. longa pili adpressi 1.0 mm. longi sparsi. Pollina vacua collapsa jodo non-reagentia. Antherae rubrae 5.5 × 1.5 mm. loculi aequales barbati. Ligulae lanceolatae hyalinae 3.0 mm. longae.

**COLORADO.** BOULDER CO.: on hogback of Pierre Shales, 6 mi. N.



of Boulder along Foothills Highway, 5,500 ft. alt., 26 June 1957, W. A. Weber 10565 (COLO, GH).

It is interesting to note that the hybrids reported by Johnson included some in which the *Stipa* parent possessed a subplumose awn; in these the subplumose character showed up in the hybrid. However, in the present cross, the strongly plumose awn which is so distinctive of *Stipa neomexicana* is completely suppressed in the hybrid. Also, the present cross is the first involving a species of *Stipa* possessing the extremely long awn type characteristic of such species as *S. comata* and *S. spartea*. If the awn phenotype is a reliable indicator of genotypic divergence in *Stipa*, the present cross may be considered the widest of all those known to date.

In conclusion, one is led to ask the question: If these hybrids, which involve so many species of *Stipa*, occur at all, why are they not more frequent? Certainly there are thousands of places where the species overlap and where the possibility of hybridization exists. Yet the rarity of hybrids in this group must be a reality in view of the great number of grass collectors who have had the opportunity to observe them, and their failure to uncover more than a handful of specimens over a period of about one hundred years. It is to be hoped that future investigators will turn to the problem of the reasons for failure of hybrid zygotes (or whatever stage of development may be critical) to complete their development to form first generation hybrids in nature.

#### LITERATURE CITED

- JOHNSON, B. LENNART, AND GEORGE A. ROGIER. 1943. A cytotaxonomic study of an intergeneric hybrid between *Oryzopsis hymenoides* and *Stipa viridula*. Amer. Journ. Bot. **30**: 49-56.
- JOHNSON, B. LENNART. 1945. Natural hybrids between *Oryzopsis hymenoides* and several species of *Stipa* Op. cit. **32**: 599-608.

## A NEW CRUCIFEROUS WEED, *CALEPINA* *IRREGULARIS*, IN VIRGINIA

S. F. BLAKE

IN MARCH 1955 Miss Jennie S. Jones, seed analyst supervisor of the Division of Plant Industry, Virginia Department of Agriculture and Immigration, at Richmond, sent me for identification a fresh specimen of a flowering crucifer which had appeared that spring on the farm of L. Wesley Southworth at Kidds Fork, Caroline County, in central eastern Virginia, between Washington and Richmond. It proved to be *Calepina irregularis* (Asso) Thell. (often called *C. corvini* (All.) Desv.), a Mediterranean and Near East species which apparently has not before been found growing in either North or South America. Good fruiting specimens were collected about a month later.

The plant was widely scattered over an alfalfa field two and one-half acres in extent. Since the initial discovery the infestation has been reduced to a fraction of the original by hand rogueing and planting to a row crop, but the weed has spread to a slight extent into an adjacent field. In February 1957 all plants visible in both fields were removed by hand by a crew from the Department of Agriculture and Immigration, but in April specimens were still to be found, and some were collected for distribution to herbaria. In April the plant was also found in an alfalfa field about 3 miles away on the farm of J. R. Southworth, brother of L. W. Southworth. It has been learned that the same hay baler was used on the two farms, and it is supposed that the seed was transported in this way. A rather careful survey of that part of Caroline County has disclosed no other infestations.

The method of introduction of this species is not known. No fruits of *Calepina* were found in the samples representing the alfalfa seed planted by Mr. Southworth (which came from Kansas), and, in fact, no *Calepina* fruits have ever been found in seeds tested at Richmond. However, Mrs. Grace Cole Fleischman of Los Angeles, senior seed analyst of the Department of Agriculture of California, has found the seeds, or rather the indehiscent fruits, in samples of *Phalaris canariensis* imported from Morocco and Turkey. She writes me that during the '40's

and early '50's *Calepina* fruits were found, sometimes in considerable amount, in practically every one of a number of samples of Canary grass seed shipped from the countries mentioned. During the last 5 years she has handled fewer shipments and they have all been clean. Recently, however, she found one fruit of it in a sample of oats from Argentina. She knows of no record of the plant having been found growing on the Pacific Coast. Dr. A. L. Cabrera of La Plata writes me that he has no record of the occurrence of the species in Argentina.

The distribution of *Calepina*, as given in considerable detail by Thellung (in Hegi, *Illustrierte Flora von Mittel-Europa* 4: 191. [1916]), and as summarized by Lawalrée (*Flore générale de Belgique* 2: 202. 1956), is of considerable interest. It was originally native in the steppes north of the Caspian Sea and has been naturalized for several centuries in the Mediterranean region of Europe, later extending north into France, Belgium, Germany, Hungary, and Rumania, and occurring as an adventive plant in Great Britain, Netherlands, and Luxembourg. It is found in Algeria and as far east as Iran. It was recorded from Italy in the herbals of the 16th century, reached Paris about 1725, Belgium and Germany during the 19th century, and is apparently not spreading any farther north. O. E. Schulz in *Das Pflanzenreich* (IV, 105 (Heft 70): 225-227. 1919) brings together the lengthy synonymy and describes 4 unimportant forms, including one with rosy petals. The Virginia plant belongs to forma *major* F. Zimmermann, characterized by germinating in summer, overwintering as a rosette, and flowering the following spring, with thicker root (3-5 mm.), stems up to 50 cm. high, and many-flowered raceme. There are good figures of the species in Lawalrée (l.c. p. 201) and Hegi (pl. 129, fig. 3), and more than 20 other illustrations are cited in the *Index Londinensis*, mostly from German, French, and Italian floras.

The plant is recognized as a weed in the Old World, but apparently is not considered of much importance, and very little information about it is available. It is given in the floras of France and Germany but has attracted no attention as a weed in those countries, and is not listed in the comprehensive 4-volume work on the weeds of Russia by B. A. Keller and others (*Sornye Rasteniia SSSR*. 1934-35). It is included in the unannotated list

of the weeds of Spain by Dantín Cereceda. T. Poggi and R. Ciferri, in their work on Italian weeds (*Malerbe e lotta*. 3. ed. p. 160. 1952), merely mention it in a general list as moderately resistant to 2,4-D. The only specific account of it I have found is by Francesco Crescini (*L'Italia agricola* 67: 151-155. 1930), who discusses its occurrence in abundance in alfalfa fields near Bologna, notes that the fruits germinate best after exposure to heat and dryness on the surface of the soil, and concludes that the best way to eradicate it is to pull up the plants at intervals during the winter and early spring as they come up in a field.

*Calepina* is placed by Schulz in the subtribe *Raphaninae*, the fruit being regarded as morphologically 2-jointed with the lower joint completely suppressed. The following description should facilitate the recognition of the plant if it turns up elsewhere.

Annual or biennial, usually 30-50 cm. high, with many erectish stems, these few-branched above, glabrous throughout and somewhat glaucous; lowest leaves in a rosette, 15 cm. long or less, lyrate-pinnatifid, the others narrowly obovate to oblong, slightly toothed or the upper entire, sessile, sagittate-clasping; flowers small, in anthesis corymbosely crowded at apex of stems and branches, in fruit forming loose racemes, not bracted; pedicels slender, erectish, in fruit 5-12 mm. long; petals white, somewhat unequal (the 2 outer larger), 2.8 mm. long or less; fruit nut-like, indehiscent, 1-celled, 1-seeded, readily deciduous, globose-ovoid, bluntly short-pointed, 4-ribbed (2 of the ribs weaker) and reticulate, glabrous, 2.5-4 mm. long, tipped with the sessile stigma.—CROPS RESEARCH DIVISION, AGRICULTURAL RESEARCH SERVICE, U. S. DEPT. AGRICULTURE, BELTSVILLE, MD.

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ORCHIDACEAE NEOTROPICALES III. DE ORCHIDA-  
CEIS INSULARUM TRINIDAD ET TOBAGO  
NOTULAE ADDITICIAE

RICHARD EVANS SCHULTES

THE WORK of completing an orchid flora of Trinidad and Tobago has brought to light several data worthy of consideration. The following notes complement those which were published in the first<sup>1</sup> paper of this series.

I acknowledge the continued and valuable help of Dr. Wilbur G. Downs and Dr. T. H. G. Aitken of the Trinidad Regional

<sup>1</sup> Schultes: "Orchidaceae Neotropicales I" in *Bot. Mus. Leaflet*, Harvard Univ. 17 (1956) 179. "Orchidaceae Neotropicales II. De orchidaceis principaliter colombianis notulae" was published in *Caldasia* 7 (1957) 339-356.

Virus Laboratory in sending pertinent field observations and in their intensive collecting and cultivation of native orchids. I must also mention with appreciation the interest shown by Dr. G. A. C. Herklots, Principal of the Imperial College of Tropical Agriculture, in the progress of our work on the orchids of the Colony. Thanks are due my colleague, Mr. Leslie A. Garay, Assistant Curator of the University of Toronto Herbarium, for his collaboration and to Mr. Elmer W. Smith for his careful delineation of the new species of *Erythroides* which Mr. Garay has herein published.

***Coryanthes macrantha* (Hook.) Hooker** in Bot. Mag. (1831) t. 3102.

**Trinidad:** Ex. coll. E. J. S. Dudley, (flowering) December 4, 1955, W. G. Downs & T. H. G. Aitken 72 (Herb. Ames 67906); Waller Field, November 24, 1956, G. A. C. Herklots s.n. (Herb. Trin. 15413, sheets 1 & 2).

Until very recently, we have not been able to report *Coryanthes macrantha* as an undoubted native element of the flora of Trinidad, as the provenience of all of the collections was designated as gardens or experimental stations (Schultes: op. cit. 182).

*Downs & Aitken 72*, taken from the cultivated collection of E. J. S. Dudley, Esq., is reported "presumed native," but no definite collection-locality of the cultivated material was given.

In November, 1956, Herklots collected material of *Coryanthes macrantha* at Waller Field, Trinidad, and brought it to flower in January, 1957. There is now no question that this species forms a part of the native orchidaceous flora. The field notes for this collection state: "Infls. pendulous; lip crimson; petals yellow, spotted crimson; strong 'estery' scent (amyl acetate?)."

***Epidendrum tipuloideum* Lindley** Fol. Orch. (1853) Epid. 32.

*Epidendrum Broadwayi* Ames & Schweinfurth in Bot. Mus. Leaflet. Harvard Univ. 1 (1932) 5.

**Trinidad:** Saut d'Eau, North Coast. January 18, 1931, W. E. Broadway 7444 (Herb. Ames 37893: TYPE of *Epidendrum Broadwayi*). Morne Bleu, April 9, 1955, W. Downs & T. H. G. Aitken 46 (Herb. Ames 67837). Spring Hill Estate, Arima Valley. January 13, 1957, T. H. G. Aitken s.n. (Herb. Ames 68590). **Venezuela:** Provincia de Carabobo, Campanura. Altitude 1000 ft. Funck & Schlim 575 (Photograph of type, Herb. Ames 67855). Above Colonia Tovar. Altitude

about 2000 m. Medium forest. No date. *G. C. K. Dunsterville 340* (Herb. Garay 5051).

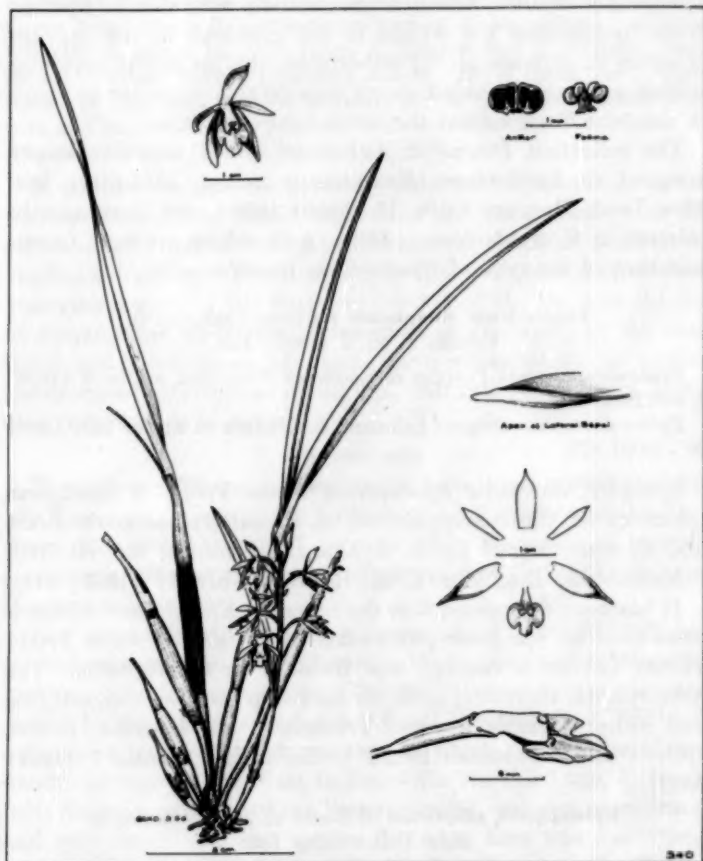
Plant small, epiphytic, up to 17 cm. tall. Stems green, brown or purple-brown, slender, subclavate. 4-8 cm. tall, invested by close, tubular scarious sheaths, apically 1- or sometimes 2-foliate. Leaves narrowly linear, grasslike, up to 20 cm. long, 1.8 cm. wide (usually much shorter and narrower), acute; mid-nerve keeled beneath. Inflorescence racemose, much shorter than leaves, up to about 6 cm. long, basally enclosed in tubular sheath up to 3.5 cm. long, loosely 4-9-flowered. Floral bracts membranaceous, minute, lanceolate, much shorter than pedicels. Pedicel with ovary up to 1.3 cm. long. Flowers yellow or yellowish green, rather fleshy. Lateral sepals obliquely elliptic-lanceolate, basally somewhat adnate to column, 11 mm. long, 3-4 mm. wide, dorsally conspicuously carinate-mucronate at apex; dorsal sepal oblong-elliptic or oblanceolate, about 10 mm. long, 3-3.7 mm. wide, acute. Petals linear-oblanceolate, up to 9.3 mm. long, somewhat oblique, acute. Lip adnate to tip of column, 3-lobed; lamina up to 5.5 mm. long, 3.7-6.4 mm. wide (at widest part), basally 2-callose; lateral lobes semi-ovate or rounded, obtuse, marginally sometimes erose, extending about half length of lip; mid-lobe larger, broadly-triangular to irregularly subquadrate, apically acute or minutely apiculate. Column stoutish, up to 6.4 mm. long.

A comparison of the type material of *Epidendrum Broadwayi* with the description and a photograph of the type and recent collections of *E. tipuloideum* leads me to the belief that the two concepts represent one variable species.

The type of *Epidendrum tipuloideum* (Funck & Schlim 575), which is at Kew, was collected in the Provincia de Carabobo in Venezuela. A photograph of the type (Herb. Ames 67855) shows Lindley's diagnostic sketches. Mr. Victor A. Summerhayes very kindly studied the type at my request and made a *camera lucida* drawing of the lip on the type sheet. His drawing indicates, as he states in his letter of May 12, 1955, that "the drawings on the type sheet made by Lindley are exaggerated in certain respects and give a false idea of the labellum." According to Summerhayes' drawing, the lip is trilobate and measures 5 mm. in length and 3.7 mm. in width (across the widest part); the column measures 5 mm. in length. The mid-lobe is broadly triangular (not narrowly lanceolate-triangular, as shown by Lindley) and acute; the lateral lobes are broad and rounded (not narrowly elongate and deeply indented along their margins, as shown by Lindley).



Summerhayes' notes continue: "*Epidendrum Broadwayi* appears very different at first, and we have material collected by Broadway at Maraval which seems identical. We also have, however, several sheets, all of cultivated material of Trinidad origin which differs from both of the others. The middle lobe is long and rather narrow but does not taper much until near the end, while the side lobes are more or less cruciform with no marked sinus between them and the middle lobe . . . I am won-



*Epidendrum tipuloides* Lindley. Drawing by G. C. K. Dunsterville of the collection Dunsterville 340.



dering if really all these varieties (including *E. Broadwayi*) are referable to one species. After all, we know precious little about the mainland forms of the species . . . and it may be equally variable in Venezuela."

A study of the material cited above convinces me that we are, in reality, faced with a single species, the lip of which especially is extremely variable in shape. There is in the Ames Herbarium and in the Garay Herbarium a critical drawing of *Dunsterville* 340 from Venezuela, which is undoubtedly referable to *Epidendrum tipuloideum* but which, in the mid-lobe of the lip, approaches *E. Broadwayi*. Furthermore, the lip in the specimen Aitken s.n. from Trinidad shows considerable variation in shape in different flowers from the same inflorescence.

The collection Downs & Aitken 46, which was erroneously assigned to *Epidendrum Rousseauae* Schltr. (Schultes: Bot. Mus. Leaf. Harvard Univ. 17 (1956) 192, t. 49), may now be referred to *E. tipuloideum*. It has a lip which strongly resembles that of the type of *Epidendrum Broadwayi*.

***Epidendrum yatapuense* Barbosa-Rodríguez** in  
Vellozia 1, ed. 2 (1891) 123.

*Epidendrum laxum* Poeppig & Endlicher Nov. Gen. ac Sp. 2 (1838) 2, non Swartz.

*Epidendrum macrothyrsis* Lehmann & Kränzlin in Engler Bot. Jahrb. 26 (1899) 472.

Recently, the name *Epidendrum laxum* Poepp. & Endl. was taken up for the concept known as *E. yatapuense* Barb.-Rodr. and *E. macrothyrsis* Lehm. & Kränzlin. (Schultes: loc. cit. 190; Schweinfurth: Bot. Mus. Leaf. Harvard Univ. 17 (1956) 214).

It has been discovered that the binomial *Epidendrum laxum* is preempted by the prior publication of *E. laxum* Swartz Prodr. (1788) 125 for a concept now included in *Pleurothallis*. The next epithet, therefore, must be taken up for this wide-ranging and rather variable species: Trinidad, Peru, Ecuador, British Guiana and Amazonian Brazil (Schultes in *Caldasia* 7 (1957) 346).

***Epistephium ellipticum* Williams & Summerhayes** in  
Kew Bull. (1928) 145.

*Epistephium tenuifolium* Mansfeld ex Hoehne Fl. Brasílica 12, 2 (1945) 42, t. 31 (*sine diagn. lat.*)

*Epistephium minutum* Barbosa-Rodríguez Jr. ex Hoehne loc. cit. (in synonym.).

**Trinidad:** Valencia Road, Mora Forest end, September 1, 1925, *R. O. Williams et al. s.n.* (Herb. Trin. 11324); Aripo Pool, December 26, 1927, *R. O. Williams & Cheesman s.n.* (Herb. Trin. 11903); near Aripo Pool, June 13, 1928, *R. O. Williams & G. W. Freeman s.n.* (Herb. N. Y.); Long Stretch, February 11, 1953, *N. W. Simmonds s.n.* (Herb. Trin. 14870); Long Stretch, near Gravel Pit, October 27, 1955, *N. W. Simmonds s.n.* (Herb. Trin. 15364). **Venezuela:** Estado Bolívar, Chimantá Massif. Forested west-facing slopes with sandstone boulders, between Camp 2 and Camp 3, northwestern part of Abácapa-tepuí. Altitude 850–1100 m. April 18, 1953, *Julian A. Steyermark 75115* (Herb. Ames 68525). Estado Bolívar, Chimantá Massif. Dense forest along upper reaches of Río Tirica between southeast part of Apácara-tepuí and west part of Chimantá-tepuí. Altitude 1700 m. June 24, 1953, *Julian A. Steyermark 75976* (Herb. Chicago 1,443,160).

It would seem that the invalidly published *Epistephium tenuifolium* from Pará, Brazil, represents the same concept as *E. ellipticum*. There is a slight difference in shape of the leaves. Hoehne's drawing of *Epistephium tenuifolium* shows a somewhat emarginate apex of the flattened portion of the lip, and the lip of *Epistephium ellipticum* is described as "entire." In the material and descriptions at hand, there appeared to be appreciable variability in size of the lip. All other characters, however, would seem to agree.

#### ERYTHRODES

The following notes on *Erythrodes* have been contributed by Mr. Leslie A. Garay of the University of Toronto and the National Research Council of Canada. Mr. Garay is at present spending a year at the Orchid Herbarium of Oakes Ames as a Guggenheim Fellow.

The genus *Erythrodes* encompasses about 100 different described concepts, and is distributed in the tropical and subtropical regions of both hemispheres. The majority of the species are native to the American tropics. From the Island of Trinidad only three species are known, two of which occur quite abundantly throughout the West Indies, while the third one, *E. trinitatis* Ames, a member of the "querceticola" complex, is endemic and very rare. The new species described here was discovered among the thousands of yet unidentified specimens in the Reichenbach Herbarium in Vienna.



*Erythroxes Schultesiana* Garay. 1. Habit, about  $\frac{1}{2}$  natural size; 2. Side view of flower, about 5 times natural size; 3. Lip, drawn without spur, about 6 times natural size; 4. Lip from above, drawn with spur, about 3 times natural size. Drawn by Elmer W. Smith.

The species, known only from Trinidad, may be distinguished by the following artificial key:

A. Inflorescence with an elongated peduncle.

I. Sepals 6-8 mm. long ..... *E. plantaginea* (L.) Fawc. & Rendle



The collection cited herewith represents a species which has hitherto been thought to be endemic to Costa Rica and Honduras.<sup>2</sup> The discovery of *Maxillaria Reichenheimiana* in Trinidad is most unexpected.

The Trinidad specimen has larger flowers and more narrowly lanceolate leaves than most of the material in the Ames Herbarium from Middle America, but there are no morphological differences of sufficient importance to separate it even to a varietal status. In Middle America, *Maxillaria Reichenheimiana* is rather variable in shape of leaf and size of flower.

***Quekettia pygmaea*** (Cogn.) Garay & R. E. Schultes comb. nov.

*Ionopsis pygmaea* Cogniaux in Urban Symb. Antill. 6 (1910) 624.

*Trizeuxis pygmaea* (Cogn.) Schlechter in Urban loc. cit. 7 (1913) 498.

**Trinidad:** Caparo, March 27, 1908, W. E. Broadway 2251 (Herb. Ames 10644; 21048).

A critical study of this concept, the generic position of which has not hitherto been entirely clear, indicates that Cogniaux's *Ionopsis pygmaea* properly belongs in *Quekettia*. It cannot be accommodated in *Ionopsis* because the flower is not spurred. While it does not exhibit all of the characters hitherto thought to be essential to *Quekettia* (e.g., a basally excavate lip), there seems little doubt that it should be referred to this generic concept.

We cannot place this species in *Trizeuxis*, as its sepals are not deeply connate (but scarcely so). There are also discrepancies in the structure of the column and in the anther which seem to separate it from *Trizeuxis*. The only illustration of the species was recently published under the binomial *Ionopsis pygmaea* (Schultes in Bot. Mus. Leaflet. Harvard Univ. 17 (1956) t. L).

*Quekettia* is a genus of three species distributed through eastern South America from Dutch Guiana, Brazil and Argentina. It is now registered for the first time from Trinidad. We maintain *Capanemia* Barb.-Rodr. as a genus distinct from *Quekettia*.

***Xylobium palmifolium*** (Sw.) Benth. ex Fawcett

Fl. Pl. Jam. (1893) 39.

**Trinidad:** Saut d'Eau, North Coast, August 1930, W. E. Broadway 7435 (Herb. Ames 36525).

<sup>2</sup> Downs, W. G., in Bull. Am. Orch. Soc. 26 (1957) 686.

*Xylobium palmifolium*, a West Indian species, has hitherto been known from Trinidad apparently only from a *Bradford* collection.

PLANTS NEW TO ILLINOIS AND TO THE CHICAGO REGION.—Intensive collecting in the Milwaukee Road classification yard at Bensenville, Cook County, Illinois during August, 1956 resulted in the discovery of the following new Illinois or Chicago region plant records. All specimens are on file in the Illinois herbarium of the Chicago Natural History Museum.

1. NEW TO ILLINOIS

*Artemisia frigida* Willd. August 8, 1956, Thieret 2205.

the most common *Artemisia* in the yard, about 30 plants seen.

*Senecio viscosus* L. August 8, 1956, Thieret 2233.

two colonies, with 8 and 13 plants.

*Chenopodium rubrum* L. August 8, 1956, Thieret 2260.

a group of fifteen plants, growing with *Chenopodium glaucum* and *Atriplex argentea*.

2. NEW TO THE CHICAGO REGION

*Lepidium perfoliatum* L. August 9, 1956, Thieret 2291.

scattered plants throughout the yard.

*Artemisia absinthium* L. August 8, 1956, Thieret 2198.

3 plants seen, each in a different area of the yard.—JOHN W.

THIERET, CHICAGO NATURAL HISTORY MUSEUM.

A NEW VARIETY OF *RUDBECKIA CALIFORNICA*.—***Rudbeckia californica*** Gray var. ***intermedia*** var. nov. Folia glabra et glauca, ovata vel anguste elliptica, margine grosse crenato, serrato, vel basi lobato.

Leaves glabrous and glaucous, ovate to narrowly-elliptical, apex acute or acuminate, base acute or rounded; the margins very irregular, coarsely crenate, dentate, or serrate, or irregularly lobed near the base, rarely almost entire; blades of the basal leaves mostly 1.5–2 dm. long; heads mostly 1 per stem; involueral bracts ciliate, glabrous and glaucous; disk globose or globose-conical, 1.5–2.5 (–3.5) cm. high, up to 1.4 cm. wide.

Type: Mt. Eddy, Siskiyou Co., California, *L. E. Smith* 557, September 1, 1913. Type in the Gray Herbarium, isotype in the U. S. National Herbarium.

Distribution: Klamath Mts., northern California, at altitudes of 3500 to 5000 feet.

The broader leaves with toothed or lobed margins readily distinguish the new variety from its nearest relative, *R. californica*.



*nica* var. *glauca* Blake, a narrow-leaved plant with entire leaf margins which occupies a disjunct area in northwestern California and adjacent Oregon. The glabrous leaves of var. *intermedia* clearly distinguish this variety from the conspicuously pubescent *R. californica* var. *californica* of the Sierra Nevada.—ROBERT E. PERDUE, JR., U. S. DEPARTMENT OF AGRICULTURE, AGRICULTURAL RESEARCH SERVICE, CROPS RESEARCH DIVISION, BELTSVILLE, MD.

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A POSTHUMOUS EDITION.<sup>1</sup>—It is fortunate that the flora of Wisconsin is sufficiently similar to that of New England, so that this book is useful locally. It is just the sort of small publication that is most urgently needed for the use of plant taxonomists teaching courses in New England, or amateurs of all levels of competence. Here is a book that will introduce students and advanced amateurs to the plants they meet around them, without bringing in the welter of extra-limital plants which cause confusion in large manuals.

The book has a large number of botanically accurate line-drawn illustrations, which greatly simplify the problem of identification. The accuracy of the illustrations is a rather unique feature in such a small publication.

This book should be available to all students taking a taxonomy course. It serves as a very fine introduction to the important study and fine hobby of botanizing, and it shames those of us in New England who should have prepared such a book for our own area.—W. H. DRURY, JR., LINCOLN, MASS.

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#### A NEW FLORA OF GREENLAND<sup>2</sup>

WHILE WAITING for the completion of the very slowly published North American Flora, several manuals of small parts of this continent have been worked out and published in recent years. Some are scientific floras of little interest to the non-specialist ranging up to the high quality characterizing the Flora of Alaska and Yukon by Hultén. Others are of the more popular type where scientific exactness is left out for the sake of simplicity. Only a few of the recent floras are, however, of the combined scientific and popular kind which can be used by amateurs and specialists alike and encourage an interest in botany more than other media are able to do. The Gray's Manual is of this type, and also the much too voluminous and expensive new Britton and Brown, but other regions not covered by these works still are waiting for a handy manual. Especially the arctic and subarctic parts of the con-

<sup>1</sup> *The Spring Flora of Wisconsin* by Norman C. Fassett, The University of Wisconsin Press, Madison, Wisconsin, 1957. v plus 189 pp.; price \$2.50.

<sup>2</sup> TYGE W. BÜCHER, KJELD HOLMEN, KNUD JAKOBSEN: *Grönlands Flora. Med illustrationer af Ingeborg Frederiksen*. P. Haase & Søn's Forlag, København, 1957. 313 pp.



continent are helpless in this respect, since the scientific manuals of Polunin, Porsild, and the Danish botanists working in Greenland are useful only to the specialist.<sup>1</sup> The amateurs and occasional travellers, being much more numerous than the taxonomists and plant geographers, would be able to help considerably more in botanical exploration if such good and simple manuals were only available to them.

This is an appropriate occasion to welcome one such scientific and popular flora of an area of this continent perhaps better known botanically than the more heavily populated regions, despite its northern and isolated situation. One of the most-renowned specialists on the flora and vegetation of Greenland, Professor Tyge W. Böcher of Copenhagen, and two of his most able students, Kjeld Holmen and Knud Jakobsen, have put together the results of past explorations of Greenland in a very exemplary flora written in a popular style without losing scientific clarity. To add to the already high quality of the text, they had the assistance of Miss Ingeborg Frederiksen, an excellent botanical artist, to make informative and clear drawings of many of the critical taxa, some in color.

The Greenland flora is a textbook of botany on a small scale, since its first twenty pages give a concise review of the morphology of the plants to aid in understanding the descriptions. There is also information on the life-forms and distribution of the plants, the floristic provinces of Greenland, and the plant associations. Most of the book, however, is devoted to a detailed description of the almost 600 higher plants known to occur in Greenland, with particular information on their distribution inside the country and a sketchy mention of their range outside the region.

The general disposition of the Greenland flora is very much like the conventional European manuals. Every family can be determined by aid of a good general key, and it is also described briefly in its appropriate place. If a family includes more than a single genus in Greenland, a concise key makes it easy to separate these genera. Many genera are represented by one species only, but where more are present, the genus as a whole gets a short general description followed by a short key to the species. Every species is then described in fairly great detail in some few to a dozen lines, followed by the information on its distribution. If intraspecific variations are known from Greenland, these are mentioned, and so also are hybrids when occurring in the area. The nomenclature used is highly modern and synonyms are included whenever necessary.

In most cases the species concept is modern and narrow and clearly affected by the experimental works by the authors and other Scandinavians, and the generic delimitations are also highly critical. Thus, the genus *Torularia* is included in *Braya* on the basis of recent results from experiments, while *Harrimanella* is separated from *Cassiope* on similar

<sup>1</sup> This was written before the publication of the new Illustrated Flora of the Canadian Arctic Archipelago by A. E. Porsild, Nat. Mus. Canada Bull. 146. 1957.

evidence. But the consistency in the species concept is somewhat dim in places. For instance, *Epilobium arcticum* is separated from *E. davuricum*, *Saxifraga hyperborea* from *S. rivularis*, *S. tenuis* from *S. nivalis*, *Empetrum hermaphroditum* from *E. nigrum*, and *Stellaria longipes* is divided into six species. At the same time, *Saxifraga rosacea* is regarded as a subspecies only of *S. caespitosa*, *Myriophyllum exallescens* is listed as a subspecies of *M. spicatum*, and *Salix callicarpaea* is given as a subspecies of *S. glauca*. Also, *Oryzococcus microcarpus* here is a subspecies of *O. quadripetalus*, *Vaccinium microphyllum* is taken as only a subspecies of *V. uliginosum*, and *Leucorchis straminea* is regarded as only a variety of *L. albida*. These are but a few examples of the inconsistency in species concept met with in the flora, but although this will not aid the user of the manual to get a clear concept of the species of the taxonomists, it does not decrease the usefulness of the book in any way since clear synonymy is always given and the names of intra-specific variations are included.

There is, however, one fact which considerably decreases the usefulness of this scientific and popular flora, perhaps the best available for any region in North America. Because most of the species—with the exception of the thirty-odd Greenland endemics—are also met with in the Canadian Eastern Arctic, the flora would have been very useful here, had it not been written in Danish. The excuse for this is mentioned in the foreword: it is intended mainly for the school-children in Greenland, the Danish ones as well as the Eskimos, although the latter will have to read it in a language perhaps more foreign to them than Danish is to an American. To simplify the reading for the Eskimos, there is one page written in their language and also a few plant names. And a one-page English guide and translation of the names of the floristic provinces and the frequency information is supposed to be enough to make the book useful also to English-speaking botanists. Certainly, plant geographers without knowledge of Danish will be able to get useful information from the book because of these translations, but had only the keys also been translated into English, the book would have become useful to all English-speaking travellers in Greenland and the Canadian Eastern Arctic. It is to be hoped that the authors will find it possible to translate their flora into English very soon, since it is without doubt the most valuable manual of arctic plants available to the western world.

The new Greenland flora, though not in English, is one of the books no botanist interested in the arctic regions can afford to be without. It certainly stands in the highest class of American botanical manuals and is a very worthy monument of the exemplary Danish exploration of Greenland which still is to be repeated elsewhere in the North American Arctic.—ÅSKELL LÖVE, INSTITUT BOTANIQUE DE L'UNIVERSITÉ DE MONTRÉAL, 4101 EST, RUE SHERBROOKE, MONTRÉAL 36.

Volume 59, number 706, including pages 245-272, was issued 15 November, 1957.

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